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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.          | CONFIRMATION NO.       |
|--|-------------|----------------------|------------------------------|------------------------|
| 10/551,946   | 10/05/2005  | Seok Koo Kim         | LEE-0033                     | 3418                   |
| 23413  | 7590        | 10/25/2007           |                              |                        |
| CANTOR COLBURN, LLP<br>55 GRIFFIN ROAD SOUTH<br>BLOOMFIELD, CT 06002 |             |                      | EXAMINER<br>MARTIN, ANGELA J |                        |
|  |             |                      | ART UNIT<br>1795             | PAPER NUMBER           |
|  |             |                      | MAIL DATE<br>10/25/2007      | DELIVERY MODE<br>PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/551,946

Applicant(s)

KIM ET AL.

Examiner

Angela J. Martin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/6/07 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This Office Action is responsive to the Amendment filed on August 6, 2007. The Applicant has amended the drawing (Fig. 1); Applicant has overcome the objection to the drawing. No claims have been amended or canceled. However, a new rejection is presented for the following reasons of record.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim, KR 1020000014672 (machine translation) in view of Inada et al., U.S. Pat. No. 7,261,972 B2.

Rejection of claims 1-7 drawn to an anode active material.

Kim teaches an anode active material slurry comprising: (a) a carbon-based anode active material, that is capable of lithium ion intercalation/deintercalation (Li-ion secondary battery) (abstract); (b) a conductive agent (section 10); (c) a binder comprising a styrene-butadiene-based polymer resin (section 10); (d) a thickener comprising a cellulose-based (section 18); and (f) water (section 18).

Kim does not teach a dispersant comprising a polymer backbone capable of surface-adsorption and a side-chain having non-ionic surfactant properties. The anode active material slurry according to claim 1, wherein the content of the dispersant ranges from 0.01 wt % to 10 wt % based on the total weight of the anode active material slurry (solid content). The anode active material slurry according to claim 1, wherein the polymer backbone in the dispersant is polymethylmethacrylate (PMMA) or polyvinylidene fluoride (PVdF). The anode active material slurry according to claim 1, wherein the side-chain having non-ionic surfactant properties in the dispersant is at least one selected from the group consisting of alkyl- and alkylaryl-polyoxyethylene ethers, alkylarylformaldehyde-condensated polyoxyethylene ethers, block polymers having polyoxypropylene as an oleophilic group, polyoxyethylene ethers of glycerin ester, polyoxyethylene ethers of sorbitan ester, polyoxyethylene ethers of sorbitol ester, polyethyleneglycol fatty acid esters, glycerin esters, sorbitan esters, propyleneglycol esters, sugar esters, fatty acid alkanol amides, polyoxyethylene fatty acid amides, polyoxyethylene alkylamines, amine oxides, alcohol ethoxylates, polyethylene oxide (PEO-based materials), alkyl phenol ethoxylates, fatty amine ethoxylates, glucosides, ethylene oxide-propylene oxide copolymers and alkanolamides. The anode active material slurry according to claim 1, wherein the dispersant is a copolymer formed of polymethylmethacrylate and polyethylene oxide. The anode active material slurry according to claim 1, wherein the dispersant has a weight average molecular weight ranged from 10,000 to 30,000. A lithium secondary cell comprising an anode obtained by using the anode active material slurry according to claim 1. The lithium secondary

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cell according to claim 7, wherein the content of the dispersant ranges from 0.01 wt % to 10 wt % based on the total weight of the anode active material slurry (solid content).

The lithium secondary cell according to claim 7, wherein the polymer backbone in the dispersant is polymethylmethacrylate (PMMA) or polyvinylidene fluoride (PVdF). The lithium secondary cell according to claim 7, wherein the side-chain having non-ionic surfactant properties in the dispersant is at least one selected from the group consisting of alkyl- and alkylaryl-polyoxyethylene ethers, alkylarylformaldehyde-condensated polyoxyethylene ethers, block polymers having polyoxypropylene as an oleophilic group, polyoxyethylene ethers of glycerin ester, polyoxyethylene ethers of sorbitan ester, polyoxyethylene ethers of sorbitol ester, polyethyleneglycol fatty acid esters, glycerin esters, sorbitan esters, propyleneglycol esters, sugar esters, fatty acid alkanol amides, polyoxyethylene fatty acid amides, polyoxyethylene alkylamines, amine oxides, alcohol ethoxylates, polyethylene oxide (PEO-based materials), alkyl phenol ethoxylates, fatty amine ethoxylates, glucosides, ethylene oxide-propylene oxide copolymers and alkanolamides. The lithium secondary cell according to claim 7, wherein the dispersant is a copolymer formed of polymethylmethacrylate and polyethylene oxide. The lithium secondary cell according to claim 7, wherein the dispersant has a weight average molecular weight ranged from 10,000 to 30,000.

Inada et al., teach a polymer backbone in the dispersant is polymethylmethacrylate (PMMA) and polyethylene oxide (col. 4, lines 7-16).

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Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to insert the teachings of Inada et al., into Kim because Inada et al., teach: "The electrode group may also contain an adhesive polymer in order to reinforce the integrating strength of the positive electrode, negative electrode and separator. Such adhesive polymer is desired to maintain a high adhesion while holding the nonaqueous electrolysis solution. Such polymer is more preferably when the lithium ion conductivity is higher. Specific examples include polyacrylonitrile (PAN), polyacrylate (PMMA), polyvinylidene fluoride (PVdF), polyvinyl chloride (PVC), and polyethylene oxide (PEO)." (col. 4, lines 7-16).

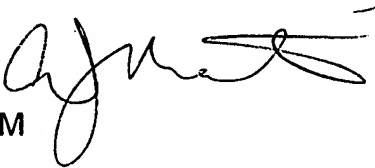
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 10:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJM

A handwritten signature in black ink, appearing to be 'AJM' followed by a stylized flourish.